

Amendments to the Claims

Please amend the pending claims as follows:

1. (currently amended) An electron source for an X-ray scanner comprising:

electron emitting means defining a plurality of electron source regions;[[,]]

an extraction grid defining a plurality of grid regions each associated with at least a respective one of the electron source regions;[[,]] and

control means arranged to control the relative electrical potential between each of the grid regions and the respective source region so that the position from which electrons are extracted from the emitting means can be moved between said source regions.

2. (original) An electron source according to claim 1 wherein the extraction grid comprises a plurality of grid elements spaced along the emitting means.

3. (original) An electron source according to claim 2 wherein the emitting means comprises an elongate emitter member and the grid elements are spaced along the emitter member such that the source regions are each at a respective position along the emitter member.

4. (currently amended) An electron source according to claim 2 ~~or claim 3~~ wherein the control means is arranged to connect each of the grid elements to either an extracting electrical potential which is positive with respect to the emitting means or an inhibiting electrical potential which is negative with respect to the emitting means.

5. (original) An electron source according to claim 4 wherein the control means is arranged to connect the grid elements to the extracting potential successively in adjacent pairs so as to direct a beam of electrons between each pair of grid elements.

6. (currently amended) An electron source according to claim 5 wherein each of the grid elements is ~~can be~~ connected to the same electrical potential as either of the grid elements which are adjacent to it, ~~so that it can be part of two different said pairs.~~

7. (currently amended) An electron source according to claim 5 ~~or claim 6~~ wherein the control means connects the grid elements

to either side of an adjacent pair to the inhibiting potential
~~is arranged, while each of said adjacent pairs is connected to~~
~~the extracting potential, to connect the grid elements to either~~
~~side of the pair to the inhibiting potential.~~

8. (currently amended) An electron source according to claim 7
wherein the control means connects all remaining grid elements
to the inhibiting potential ~~is arranged, while each of said~~
~~adjacent pairs is connected to the extracting potential, to~~
~~connect all of the grid elements not in the pair to the~~
~~inhibiting potential.~~

9. (currently amended) An electron source according to claim 3
~~any of claims 2 to 8~~ wherein the grid elements comprise parallel
elongate members.

10. (currently amended) An electron source according to claim 9
~~when dependent on claim 3~~ wherein the emitting member extends
substantially perpendicularly to the grid elements.

11. (currently amended) An electron source according to claim 2
~~any of claims 2 to 10~~ wherein the grid elements comprise wires.

12. (currently amended) An electron source according to claim 3
~~or any foregoing claim dependent thereon~~ wherein the grid
elements are planar and extend in a plane substantially
perpendicular to the emitter member ~~so as to protect the emitter~~
~~member from reverse ion bombardment from the anode.~~

13. (currently amended) An electron source according to claim 2
~~any of claims 2 to 12~~ wherein the grid elements are spaced from
the emitting means by a distance approximately equal to the
distance between adjacent grid elements.

14. (currently amended) An electron source according to claim 2
~~any foregoing claim~~ further comprising a plurality of focusing
elements arranged to focus ~~the~~ beams of electrons after they
have passed the grid.

15. (original) An electron source according to claim 14 wherein
the focusing elements are elongate.

16. (currently amended) An electron source according to claim
14 ~~or claim 15 when dependent on claim 2~~ wherein the focusing
elements are parallel to the grid elements.

17. (original) An electron source according to claim 16 wherein the focusing elements are aligned with the grid elements such that electrons passing between any pair of the grid elements will pass between a corresponding pair of focusing elements.

18. (original) An electron source according to claim 17 wherein the focusing elements are spaced at equal intervals to the grid elements.

19. (currently amended) An electron source according to claim 14 ~~any of claims 14 to 18~~ wherein the focusing elements are arranged to be connected to an electric potential which is positive with respect to the emitter.

20. (original) An electron source according to claim 19 wherein the focusing elements are arranged to be connected to an electric potential which is negative with respect to the grid elements.

21. (currently amended) An electron source according to claim 14 ~~any of claims 14 to 20~~ wherein the control means is arranged to control the potential applied to the focusing elements thereby to control focusing of the beams of electrons.

22. (currently amended) An electron source according to claim 14 ~~any of claims 14 to 21~~ wherein the focusing elements comprise wires.

23. (currently amended) An electron source according to claim 14 ~~any of claims 14 to 22~~ wherein the focusing elements are planar and extend in a plane substantially parallel to the direction in which the source regions are arranged to emit electrons ~~so as to protect the emitter means from reverse ion bombardment from an anode.~~

24. (currently amended) An electron source according to claim 4 ~~or any foregoing claim dependent thereon~~ wherein the grid elements are spaced from the emitter such that if a group of one or more adjacent grid elements are switched to the extracting potential, electrons will be extracted from a length of the emitter member which is longer than the width of said group of grid elements.

25. (original) An electron source according to claim 24 wherein the grid elements are spaced from the emitter member by a distance which is at least substantially equal to the distance between adjacent grid elements.

26. (currently amended) An electron source according to claim 24 ~~or claim 25~~ wherein the grid elements are spaced from the emitter member by a distance of ~~the order of~~ 5mm.

27. (cancelled)

28. (currently amended) An electron source according to claim 24 ~~any of claims 24 to 27~~ wherein the grid elements are arranged to at least partially focus the extracted electrons into a beam.

29. (original) An electron source according to claim 1 wherein the source regions are formed on respective emitting members which are electrically insulated from each other and the control means is arranged to vary the electric potential of the emitting members to control said relative electric potentials.

30. (currently amended) An electron source according to claim 29 wherein the grid is ~~arranged to be held~~ at a constant potential.

31. (currently amended) An electron source according to claim 30 further comprising focusing elements ~~which are also arranged to be held~~ at a constant potential.

32. (currently amended) An electron source according to claim 31 wherein the focusing elements are ~~arranged to be held~~ at the same potential as the grid.

33. (currently amended) An electron source according to claim 31 ~~or claim 32~~ wherein each focusing element is spaced at a distance between and in front of the focusing elements are arranged such that there is one focusing element between, but spaced forwards from, each adjacent pair of emitter members.

34. (currently amended) An electron source according to claim 1 ~~any foregoing claim~~ wherein the control means activates ~~is arranged to activate~~ each of the source regions in turn.

35. (currently amended) An electron source according to claim 1 ~~any foregoing claim~~ wherein the control means controls ~~is arranged to control~~ the electric potentials of the source regions and ~~or~~ the grid regions ~~so as to~~ extract electrons from a plurality of successive groupings of said source regions ~~each grouping producing an illumination having a square wave pattern of a different wavelength.~~

36. (currently amended) ~~An X-ray tube comprising an~~ The electron source of claim 1 wherein said electron source according to any foregoing claim and at least one anode comprise an X-ray tube.

37. (currently amended) The at least one anode ~~An X-ray tube according to claim 36 further comprising wherein the at least one anode comprises~~ an elongate anode arranged such that beams of electrons produced by different grid elements will hit different parts of the anode.

38. (cancelled)

39. (cancelled)

40. (cancelled)

41. (cancelled)

42. (currently amended) An X-ray scanner comprising:
an X-ray source having a plurality of X-ray source points;[[,]]

X-ray detection means;[[,]] and

control means arranged to control the source to produce X-rays from a plurality of successive groupings of the source points ~~each grouping producing an illumination having a square wave pattern of a different wavelength,~~ and to record a reading of the detection means for each of the illuminations.

43. (currently amended) An X-ray scanner according claim 41 ~~to any of claims 38 to 41~~ wherein the source points are arranged in a linear array.

44. (original) An X-ray scanner according to claim 43 wherein the detection means comprises a linear array of detectors extending in a direction substantially perpendicular to the linear array of source points.

45. (original) An X-ray scanner according to claim 44 wherein the control means is arranged to record a reading from each of the detectors for each illumination.

46. (original) An X-ray scanner according to claim 45 wherein the control means is arranged to use the readings from each of the detectors to reconstruct features of a respective layer of the object.

47. (original) An X-ray scanner according to claim 46 wherein the control means is arranged to use the readings to build up a three dimensional reconstruction of the object.

48. (currently amended) An X-ray scanner comprising:
an X-ray source comprising a linear array of source points; [[,]] and
a detector array, comprising a linear arrangement of detectors, wherein the linear arrays are arranged substantially perpendicular to each other; X-ray detection means comprising a linear array of detectors, and
~~control means, wherein the linear arrays are arranged substantially perpendicular to each other and the control means is arranged to control either the source points or the detector~~ [[s]] array to operate in a plurality of successive groupings, each grouping comprising groups of different numbers of the source points or detectors, and to analyse readings from the detectors using a mathematical transform to produce a three-dimensional image of an object.

49. (original) An X-ray scanner according to claim 48 wherein the control means is arranged to operate the source points in said plurality of groupings, and readings are taken simultaneously from each of the detectors for each of said groupings.

50. (original) An X-ray scanner according to claim 48 wherein the control means is arranged to operate the detectors in said plurality of groupings and, for each grouping, to activate each of the source points in turn to produce respective readings.

51. (cancelled)

52. (cancelled)

53. (cancelled)

54. (original) An electron source according to claim 29 wherein the emitting members comprise emitter pads supported on an insulating emitter block.

55. (original) An electron source according to claim 54 further comprising a layer of conductive material formed on the insulating block to provide electrical connection to the emitter pads.

56. (original) An electron source according to claim 55 wherein the emitter pads are applied onto the layers of conductive material.

57. (currently amended) An electron source according to claim 54 ~~any of claims 54 to 56~~ further comprising a heating element adjacent to the emitter block.

58. (original) An electron source according to claim 57 wherein the heating element comprises a block of insulating material with a layer of conductive material applied to it forming a heating element.

59. (currently amended) An electron source according to claim 54 ~~any of claims 54 to 58~~ further comprising a connecting element providing electrical connections for each of the emitter pads and flexible connecting elements providing electrical connections between the connecting element and the emitter block.

60. (original) An electron source according to claim 59 wherein the connecting elements are arranged to accommodate relative movement of the connecting element and the emitter pad caused by thermal expansion.